

Work Order ID 84667

May-30-12 3:47:00 PM

*Duplicate*

\*84667\*

Page 1

Item ID: D350-748-241TRN

Accept

\*N9000040100\*

Setup Start \*NS1\*

Revision ID:

Stop \*NS2\*

Item Name: Crosstube Turning Detail

Start Date: 17/05/2012 Start Qty: 1.00

\*1\*

Cust Item ID:

Required Date: 22/05/2012 Req'd Qty: 1.00

\*1\*

Customer:

Reference:

Approvals: Process Plan: MLJ

Date: 12/05/31 Tooling:

Date:

Run Start \*NR1\*

QC:

Date: SPC (Y/N):

Date:

Stop \*NR2\*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

Draw Nbr

Revision Nbr

D350-748-241

F

100

0.00

\*100\*

MORI SEIKI CNC LATHE LARGE

Mori Seiki

Memo

0.00

Mori Seiki CNC Lathe Large

1-Fill tube with sand & install plugs on both ends as per Folio FA647  
2-Turn first side as per Folio FA647  
3- File transition lines smooth.

FOLIO REV: \_\_\_\_\_

DWG REV: F

1 φ KC  
12-7-12

110

QC1- Inspect dimensions to dimension sheet

0.00

\*110\*

QC

Memo

0.00

Quality Control

1 φ KC  
12-7-12

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries



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Work Order ID 84667

\*84667\*

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May-30-12 3:47:00 PM

Item ID: D350-748-241TRN

Accept

\*N900040100\*

Setup Start \*NS1\*

Revision ID:

Item Name: Crosstube Turning Detail

Stop \*NS2\*

Start Date: 17/05/2012 Start Qty: 1.00

\*1\*

Cust Item ID:

Required Date: 22/05/2012 Req'd Qty: 1.00

\*1\*

Customer:

Reference:

Approvals:

Process Plan:

Date:

Tooling:

Date:

Run Start \*NR1\*

QC:

Date:

SPC (Y/N):

Date:

Stop \*NR2\*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
150		0.00							
*150*	Large Fab								
Crosstubes		0.00							
Crosstubes	Memo								
	1-DRILL HOLES FOR HEAT TREAT USING DT9806(HOLES MUST BE ALIGNED ON SAME LINE ON BOTH CUFFS)								
	2-Grind machining marks								
160		0.00							
*160*	Outsource process - Heat Treat								
Outsource1		0.00							
Outsource process - Heat Treat	Memo								
	Issue P/O: 17555								
	Heat Treat to min 180 KSI As per Dwg D350-748-241								
	Sand Blast tube after Heat Treat								
	Possible Supplier: Vac Aero								
	Ensure Certificate of Conformity is attached								
170		0.00							
*170*	Receive & Inspect for Damage & Mat'l Certs								
Packaging		0.00							
Packaging	Memo								
	Ensure certificate of conformaty is attached								

TRM 12-7-26  
MO 12-7-16

12-07-27

PTO

12/12/24

SP 12-8-21

W/O: 84667		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

See link 12-1914

Part No: D350-748-241TR PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: ✓ Date: 12/10/17

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: ✓ Date: \_\_\_\_\_

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12-09-21	100	Supplier did not sandblast originally per PO 17555	W 12/09/21	End for sandblasting to remove scale only Issue PO 17976 FMI	12/10/21	S 12/10/17	W 12/09/21	S 12/10/15
		RC: POOR COMMUNICATION		Review + Inspect	12/9/24			

NOTE: Date & initial all entries

# Work Order ID 84667

**\*84667\***

Page 4

May-30-12 3:47:00 PM

Item ID: D350-748-241TRN

Accept

**\*N900040100\***

Setup Start **\*NS1\***

Revision ID:

Stop **\*NS2\***

Item Name: Crosstube Turning Detail

Start Date: 17/05/2012 Start Qty: 1.00 **\*1\***

Cust Item ID:

Required Date: 22/05/2012 Req'd Qty: 1.00 **\*1\***

Customer:

Reference:

Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_

Run Start **\*NR1\***

QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Stop **\*NR2\***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
180	QC6- Inspect dimensions to drawing	0.00							
<b>*180*</b>									
QC	Memo	0.00							
Quality Control									
190		0.00							
<b>*190*</b>	Packaging								
Packaging	Memo	0.00							
Packaging	Identify and stock in kanban rack Location: <u>LG</u>								
200	QC21- Final Inspection - Work Order Release	0.00							
<b>*200*</b>									
QC	Memo	0.00							
Quality Control									

*Rm 12-7-28*

*12/10/15*

*12-10-15*

W/O:		WORK ORDER CHANGES					
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**NOTE:** Date & initial all entries



# Picklist Print

May-30-12 3:47:03 PM

Page 1

Work Order ID: 84667

**\*84667\***

Parent Item: D350-748-241TRN

**\*D350-748-241TRN\***

Parent Item Name: Crosstube Turning Detail

Start Date: 17/05/2012

Required Date: 22/05/2012

Start Qty: 1.00

Required Qty: 1.00

Comments: IPP Rev:A New Issue 08-03-06 DD verified by:ec  
 IPP Rev B Removed polish 08.04.02 EC verified by : DD  
 IPP Rev C Removed LPS-3 08.06.23 Ec verified by: DD IPP Rev D  
 11.02.24 as per dwg rev.F DD verf: JLM

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D6015-125		Manufactured	No			120	Each	38.0000	1	1			

**\*D6015-125\***

Crosstube Material

\*\*

Location

Loc Qty

Loc Code

HALL

38

61380

4

72511

34

aman.l 12/07/06

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

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**NOTE:** Date & initial all entries

<b>DART AEROSPACE LTD</b>		<b>Work Order:</b>	84667
<b>Description:</b> Crosstube Assembly (AS350/355 High Aft)		<b>Part Number:</b>	D350-748-241
<b>Inspection Dwg:</b> D350-748-241 <b>Rev:</b> F		<b>Page 1 of 1</b>	

### FIRST ARTICLE INSPECTION CHECKLIST

Inspection Sheet Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
SIDE A	2.240	+0.005/-0.000	2.244		VERN	CNC-08
	2.180	+0.005/-0.000	2.185			
	2.180	+0.005/-0.000	2.185			
	2.208	+0.005/-0.000	2.238			
	2.234	+0.005/-0.000	2.236			
	2.253	+0.005/-0.000	2.256	/		
	2.272	+0.005/-0.000	2.277	/		
	2.299	+0.005/-0.000	2.305	/		
	0.063	+/-0.010	.063	/		
	4.26	+/-0.030	4.26	/		
	R0.063	+/-0.010	.063	/	RG	
	R0.50	+/-0.030	.50	/	RG	
SIDE B	2.240	+0.005/-0.000	2.244	/	VERN	CNC-08
	2.180	+0.005/-0.000	2.184	/		
	2.180	+0.005/-0.000	2.186	/		
	2.208	+0.005/-0.000	2.213	/		
	2.234	+0.005/-0.000	2.236	/		
	2.253	+0.005/-0.000	2.255	/		
	2.272	+0.005/-0.000	2.277	/		
	2.299	+0.005/-0.000	2.305	/		
	0.063	+/-0.010	.063	/		
	4.26	+/-0.030	4.26	/		
	R0.063	+/-0.010	.063	/	RG	
	R0.50	+/-0.030	.50	/	RG	
	122.70	+/-0.060	122.70		TAPE	LG-22

<b>Measured by:</b> MML/KL	<b>Audited by:</b> JW	<b>Preliminary Approval:</b>
<b>Date:</b> 12/27/11	<b>Date:</b> 12-7-13	<b>Date:</b>

Rev	Date	Change	Revised by	Approved
A	07.01.17	New Issue (P/O D350-748-201)	KJ/JLM	
B	12.02.02	Dwg Rev updated	KJ	

**Dart Aerospace Ltd**

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

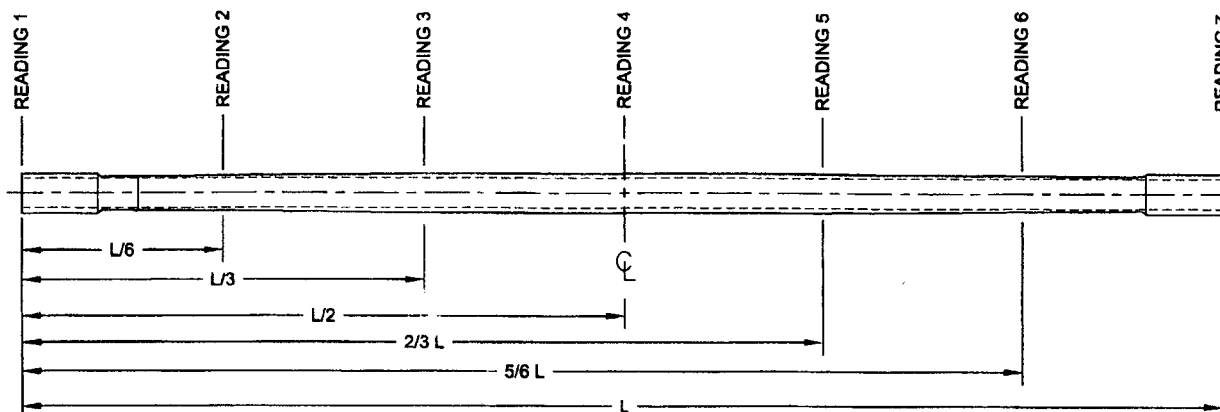
Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_  
 Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

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**NOTE:** Date & initial all entries

<b>DART AEROSPACE LTD</b>	<b>Work Order:</b>	
<b>Description:</b> Crosstube Assembly (AS350/355 High Aft)	<b>Part Number:</b>	<b>D350-748-241</b>
<b>Inspection Dwg:</b> D350-748-241 <b>Rev:</b> F		<b>Page 2 of 2</b>

### WALL THICKNESS MEASUREMENT



Location	WALL THICKNESS MEASUREMENT (IN)				Deviation $\Delta w$ (max-min)	TOLERANCE
	w1	w2	w3	w4		
READING 1 L= 0"	.125	.125	.125	.137	.012	0.030"
READING 2 L=	.114	.133	.129	.111	.022	
READING 3 L=	.151	.168	.164	.150	.018	
READING 4 L=	.164	.162	.161	.163	.003	
READING 5 L=	.153	.158	.165	.158	.012	
READING 6 L=	.111	.119	.129	.116	.018	
READING 7 L=	.129	.130	.122	.122	.008	

#### Calibration Result

Actual Block Thickness: .00200

Sitescan 250 Measured Thickness: .100-200

<b>Measured by:</b>	KC
<b>Date:</b>	12-7-12

<b>Audited by:</b>	[Signature]
<b>Date:</b>	12-7-13

<b>Preliminary Approval:</b>	
<b>Date:</b>	

Rev	Date	Change	Revised by	Approved
A	07.01.17	New Issue (P/O D350-748-201)	KJ/JLM	
B	12.02.02	Dwg Rev updated	KJ	
C	12.06.04	Wall thickness form added	KJ	[Signature]

Item	Qty -241	Part Number	Description
1	X	D350-748-241	CROSSTUBE ASSEMBLY (AS 350/355 HI AFT)
2	1	D6015-125	CROSSTUBE (OR D6018-125)
3	2	D3502-1	SUPPORT
4	2	D2856-400-710	ABRASION STRIP
5	1	AELS-1032-225	INSERT
6	1	NAS1149D0363J	WASHER (OR AN960JD10)
7	2	MS21920-20	CLAMP (PER DART SPEC. M-MS21920-20)
8	1	MS27039-1-10	SCREW

# **GENERAL NOTES:**

- 1) MATERIAL: MANUFACTURED FROM D6015-125 OR D6018-125  
FINISHED LENGTH = 122.700±0.06
- 2) FINISH: MAGNETIC PARTICLE INSPECT PER DART QSI 038 4.2  
CADMIUM PLATE PER AMS-QQ-P-416B, CLASS 1, TYPE II  
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2  
PAINT OUTSIDE PER DART QSI 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
- 6) IDENTIFICATION: DART PART NUMBER "D350-748-241" AND BATCH NUMBER ON INSIDE OF CUFF  
PER DART QSI 044 6.4 (VIBRATING STYLUS)
- 7) WEIGHT: 29.85 lbs
- 8) PART IS SYMMETRIC ABOUT CENTERLINE, EXCEPT FOR Ø0.297 HOLE.
- 9) RUN CUTTER OFF PART WHERE INDICATED. BLEND OUT ALL EDGES FROM MACHINING  
LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH. NOTE: ALL HOLES ARE DRILLED AFTER  
BENDING.
- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 7 PASSES. MAXIMUM TUBE FLATTENING DUE TO  
BENDING IS 6% BASED ON O.D.
- 11) HEAT TREAT TO MIN. 180 KSI PER MIL-T-6736 OR AMS 2759-1C AFTER TURNING. ACCEPTABLE TO  
VERIFY TENSILE STRENGTH BY HARDNESS TEST PER ASTM E18 TO 40-45 HRC.
- 12) INSTALL D2856-400-710 ABRASION STRIPS WITH A GAP ON BOTTOM SIDE OF CROSSTUBE,  
CENTERED OPPOSITE D3502-1 SUPPORT, PER QSI 035.
- 13) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE  
OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES,  
NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY.  
CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE. WHEN DRILLING HOLES EXTREME CARE  
MUST BE TAKEN AND CAREFUL DEBURRING PERFORMED TO ENSURE A CLEAN HOLE WITH NO  
CRACKING/CHIPPING/GROOVES.
- 14) TORQUE CLAMPS 60 TO 80 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT  
NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.
- 15) MAX TWIST AFTER BENDING: WITH XTUBE LAYED FLAT ON SURFACE, THE DIFFERENCE BETWEEN  
CUFF HEIGHTS FROM THE SURFACE MAY BE NO LARGER THAN 0.25 (ZN C1-3).

SHOP COPY  
RETURN TO  
ENGINEERING  
UNCONTROLLED COPY  
SUBJECT TO AMENDMENT  
WITHOUT NOTICE  
WORK ORDER

NO. 04667 MLJ  
12/05/31

RELEASED  
2011-01-08  
JP

F	ADD HRC TEST OPTION (B8-1) PER PAR 09-040, ADD TWIST LIMIT (A8-1, C1-3), ADD D6015-125 OPTION (C8-1), STOCK DIM NOW MACHINED (D1-4)	CP	10.11.23
E	REVISE GENERAL NOTES: UPDATE TO CURRENT STANDARDS; RELOCATED FLAG #6 PER PAR 08-046 (ZN A8-3); ADD TOLERANCES (ZN C6-3, D2-3)	RF	09.09.30
D	MAG. PARTICLE AND CAD PLATE AS MFD.	CP	06.10.31
C	ADD CAD PLATING	CP	06.08.14
B	ADD D6018-125 & PRIME AND PAINT	CP	06.06.30
A	NEW ISSUE	CP	06.03.31
REV.	DESCRIPTION	BY	DATE
DESIGN	DP	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	DP		
CHECKED	DP	DRAWING NO.	REV. F
MFG. APPR.	DP	D350-748-241	SHEET 1 OF 4
APPROVED	DP	TITLE	SCALE
DE APPR.	DP	CROSSTUBE (AS 350/355 HI AFT)	NTS
DATE	10.11.23	COPYRIGHT © 2006 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL, AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

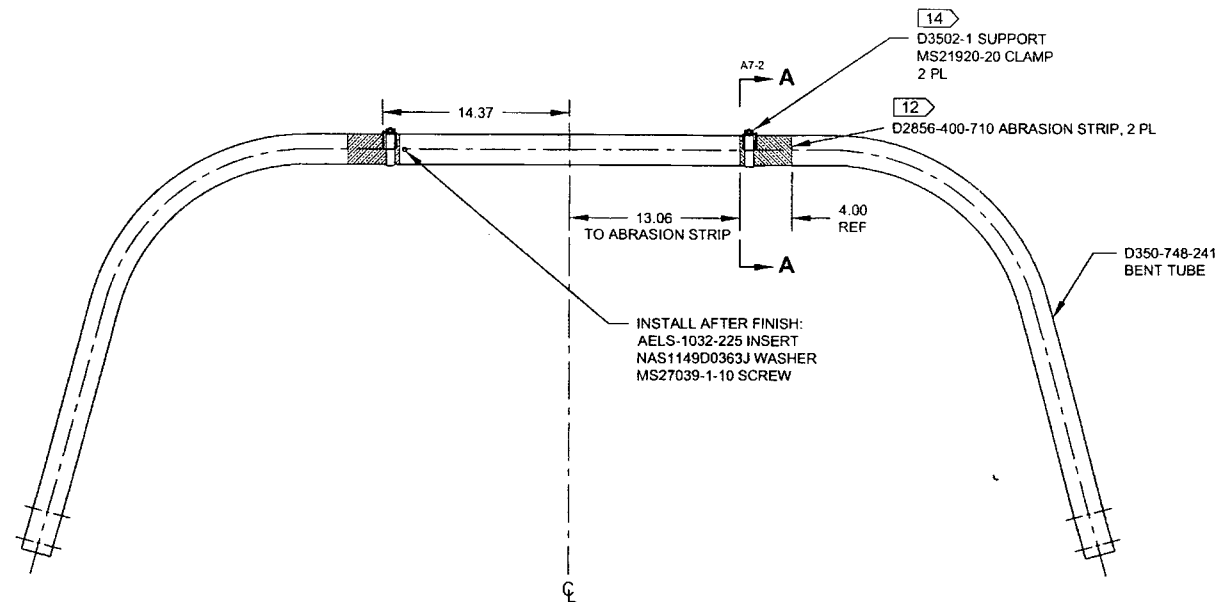
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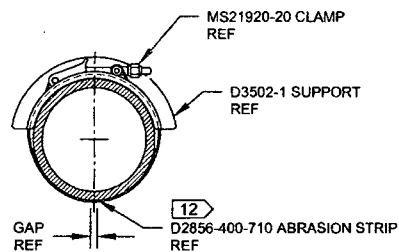
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**NOTE:** Date & initial all entries



**D350-748-241  
ASSEMBLY DETAIL**



**SECTION A-A** D4-2  
SCALE 4X

**RELEASED**  
2011-02-19  
JMR

DESIGN	90	<b>DART AEROSPACE LTD</b>	
DRAWN	90	HAWKESBURY, ONTARIO, CANADA	
CHECKED	B	DRAWING NO.	REV. F
MFG. APPR.	B	D350-748-241	SHEET 2 OF 4
APPROVED	H	TITLE	SCALE
DE APPR.	H	CROSSTUBE (AS 350/355 HI AFT)	NTS
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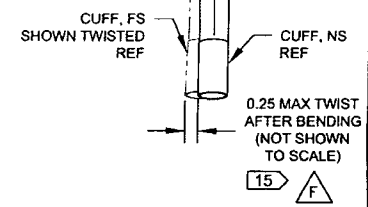
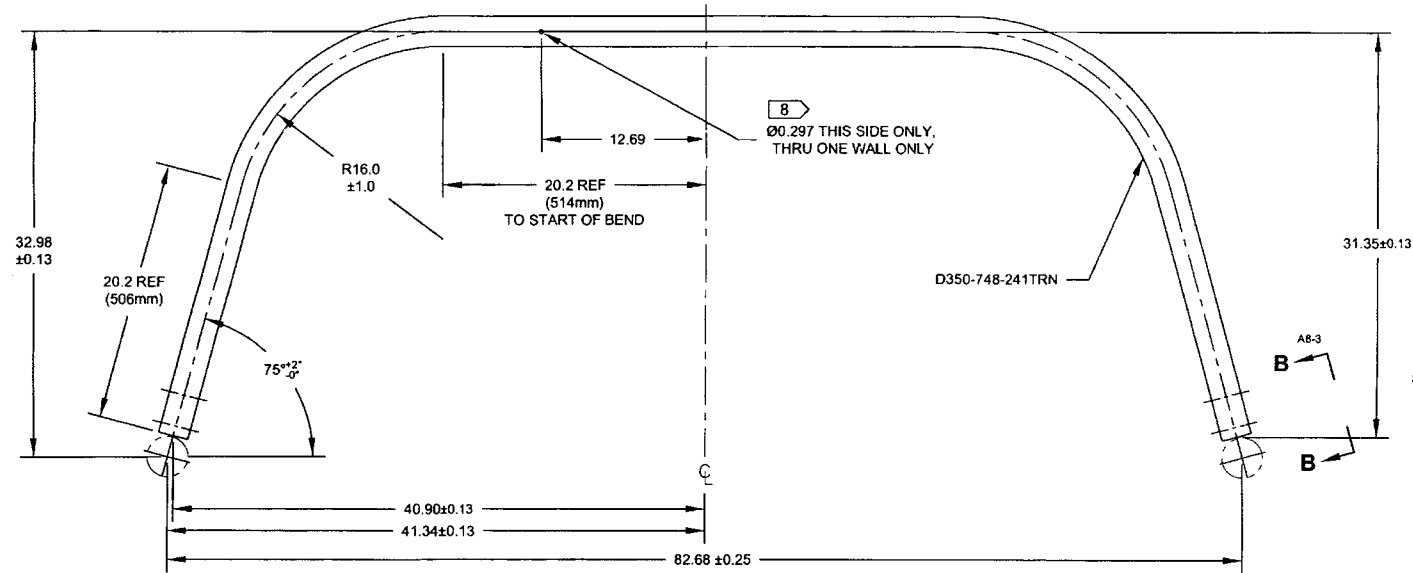
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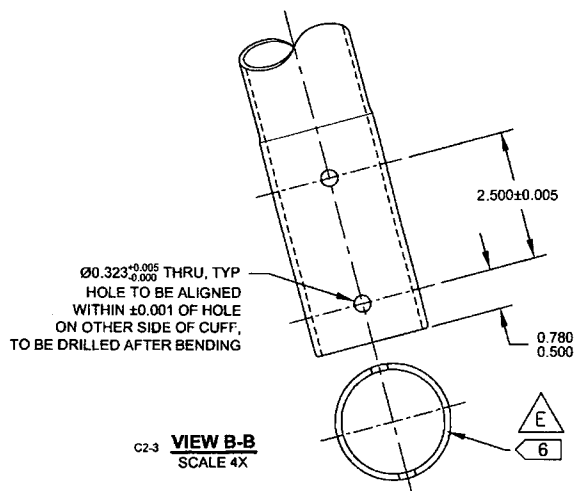
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04667



**D350-748-241**  
**BENDING AND DRILLING DETAIL** [10]



**VIEW B-B**  
**SCALE 4X**

**RELEASED**  
2011-01-18

DESIGN		<b>DART AEROSPACE LTD</b>	
DRAWN		HAWKESBURY, ONTARIO, CANADA	
CHECKED		DRAWING NO.	REV. F
MFG. APPR.		D350-748-241	SHEET 3 OF 4
APPROVED		TITLE	SCALE
DE APPR.		CROSSTUBE (AS 350/355 HI AFT)	NTS
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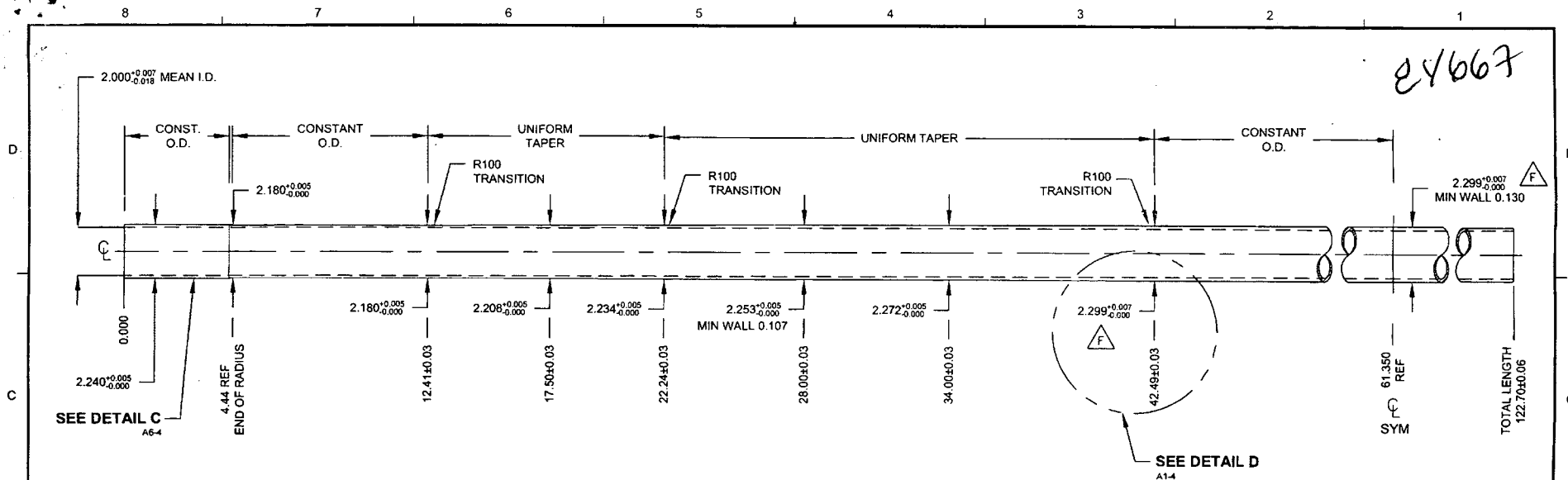
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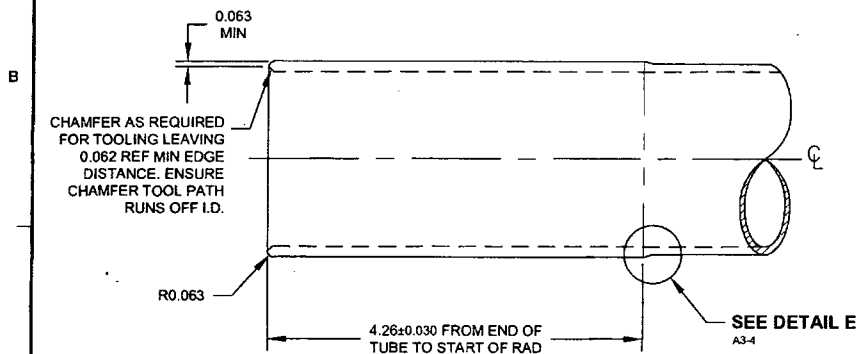
**NOTE:** Date & initial all entries

24667

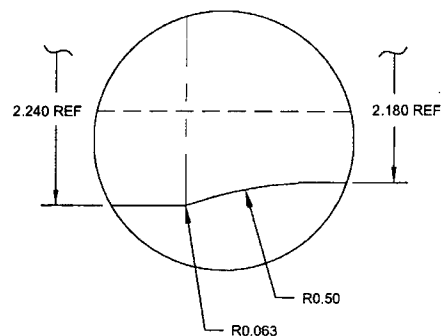


**D350-748-241TRN**  
**TURNING DETAIL**

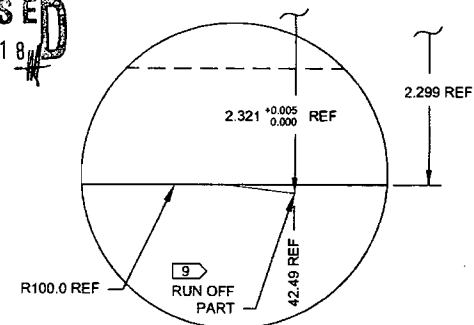
RELEASED  
2011-01-18



**DETAIL C:**  
**CROSSTUBE CUFF** C8-4  
SCALE 3X



**DETAIL E:**  
**CUFF TRANSITION** A5-4  
NOT TO SCALE



**DETAIL D:**  
**TAPER RUN-OFF** C3-4  
NOT TO SCALE

DESIGN		<b>DART AEROSPACE LTD</b>	
DRAWN	GP	HAWKESBURY, ONTARIO, CANADA	
CHECKED	GP	DRAWING NO.	REV. F
MFG. APPR.	B	D350-748-241	SHEET 4 OF 4
APPROVED	TH	TITLE	SCALE
DE APPR.	TH	CROSSTUBE (AS 350/355 HI AFT)	NTS
DATE	10.11.23	<small>COPYRIGHT © 2006 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL, AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.</small>	

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries

**METLAB**  
**1000 E. MERMAID LANE**  
**WYNDMOOR, PA 19038**

**Packing List**  
Sales Order No.

Sales Order  
Aug 1,

Voice: 215-233-2600  
Fax: 215-233-5653

Sold To:  
DART AEROSPACE  
1270 ABERDEEN STREET  
HAWKESBURY, ON K6A 1K7

Ship To:  
DART AEROSPACE  
1270 ABERDEEN STREET  
HAWKESBURY, ON K6A 1K7

Customer ID	PO Number	Payment Terms
DARA	PO17555	Net 30 Days
Ship Via		Process
R & L CARRIER		HT

Quantity	Item	Description	Total Shipped	This Ship
1.00	EACH	D350-748-241TRN HEAT TREAT TO MIN 180 KSI (MIL-T-6736 OR AMS 2759-IC) SANDBLAST AFTER HT		
1.00	EACH	D350-748-241TRN HEAT TREAT TO MIN 180 KSI (MIL-T-6736 OR AMS 2759-IC) SANDBLAST AFTER HT		
1.00	EACH	D350-748-241TRN HEAT TREAT TO MIN 180 KSI (MIL-T-6736 OR AMS 2759-IC) SANDBLAST AFTER HT		
1.00	EACH	D350-748-241TRN HEAT TREAT TO MIN 180 KSI (MIL-T-6736 OR AMS 2759-IC) SANDBLAST AFTER HT		
1.00	EACH	D350-748-241TRN HEAT TREAT TO MIN 180 KSI (MIL-T-6736 OR AMS 2759-IC) SANDBLAST AFTER HT		

COMMENTS

SHIPPED BY, SIGNATURE  
METLAB

DATE

RECEIVED BY, SIGNATURE  
DART AEROSPACE

DATE



1000 E. Mermaid La., Wyndmoor (Phila.) PA 19038-8093  
Tel. (215) 233-2600 Fax (215) 233-5653

# Invoice

Invoice Num

0114

Invoice D

Aug 16, 20

Sold To:

DART AEROSPACE  
1270 ABERDEEN STREET  
HAWKESBURY, ON K6A 1K7

Ship To:

DART AEROSPACE  
1270 ABERDEEN STREET  
HAWKESBURY, ON K6A 1K7

Customer ID		Customer PO		Payment Terms	
DARA		PO17555		Net 30 Days	
Shop Order No.		Shipping Method		Ship Date	Due Date
73276		R & L CARRIER		8/16/12	9/15/12
Quantity	Item	Description		Unit Price	Extensi
1	EACH	D350-748-241TRN HEAT TREAT TO MIN 180 KSI (MIL-T-6736 OR AMS 2759-IC) SANDBLAST AFTER HT		205.000	20
1	EACH	D350-748-241TRN HEAT TREAT TO MIN 180 KSI (MIL-T-6736 OR AMS 2759-IC) SANDBLAST AFTER HT		205.000	20
1	EACH	D350-748-241TRN HEAT TREAT TO MIN 180 KSI (MIL-T-6736 OR AMS 2759-IC) SANDBLAST AFTER HT		205.000	20
1	EACH	D350-748-241TRN HEAT TREAT TO MIN 180 KSI (MIL-T-6736 OR AMS 2759-IC) SANDBLAST AFTER HT		205.000	20
1	EACH	D350-748-241TRN HEAT TREAT TO MIN 180 KSI (MIL-T-6736 OR AMS 2759-IC) SANDBLAST AFTER HT		205.000	20
1	EACH	D350-748-241TRN HEAT TREAT TO MIN 180 KSI (MIL-T-6736 OR AMS 2759-IC) SANDBLAST AFTER HT		205.000	20

ANY DISCREPANCIES MUST BE REPORTED WITHIN 10 DAYS AFTER RECEIPT.

**We accept AMEX, Visa & Master Card**



Heat Treating and Metallurgical Consulting

Subtotal	Conti
Shipping/Handling	
Total Invoice Amount	Conti
Payment Received	
<b>TOTAL</b>	Conti

Visit our Web Site: <[www.thomasregister.com/metlab/](http://www.thomasregister.com/metlab/)>

**METLAB**  
1000 E. MERMAID LANE  
WYNDMOOR, PA 19038

**Packing I**

Sales Order No. 7

Sales Order

Aug 1,

Voice: 215-233-2600  
Fax: 215-233-5653

Sold To:  
DART AEROSPACE  
1270 ABERDEEN STREET  
HAWKESBURY, ON K6A 1K7

Ship To:  
DART AEROSPACE  
1270 ABERDEEN STREET  
HAWKESBURY, ON K6A 1K7

Customer ID	PO Number	Payment Terms
DARA	PO17555	Net 30 Days
Ship Via	Process	
R & L CARRIER		

Quantity	Item	Description	Total Shipped	This Ship
1.00	EACH	D350-748-241TRN HEAT TREAT TO MIN 180 KSI (MIL-T-6736 OR AMS 2759-IC) SANDBLAST AFTER HT		
1.00	EACH	D350-748-241TRN HEAT TREAT TO MIN 180 KSI (MIL-T-6736 OR AMS 2759-IC) SANDBLAST AFTER HT		
1.00	EACH	D350-748-241TRN HEAT TREAT TO MIN 180 KSI (MIL-T-6736 OR AMS 2759-IC) SANDBLAST AFTER HT		
1.00	EACH	D350-748-241TRN HEAT TREAT TO MIN 180 KSI (MIL-T-6736 OR AMS 2759-IC) SANDBLAST AFTER HT		
1.00	EACH	D350-748-241TRN HEAT TREAT TO MIN 180 KSI (MIL-T-6736 OR AMS 2759-IC) SANDBLAST AFTER HT		

COMMENTS

SHIPPED BY, SIGNATURE  
METLAB

DATE

RECEIVED BY, SIGNATURE  
DART AEROSPACE

DATE



DATE \_\_\_\_\_



1000 E. Mermaid La., Wyndmoor (Phila.) PA 19038-8093  
Tel. (215) 233-2600 Fax (215) 233-5653

# Invoice

Invoice Num

0114

Invoice D

Aug 16, 2

Sold To:

DART AEROSPACE  
1270 ABERDEEN STREET  
HAWKESBURY, ON K6A 1K7

Ship To:

DART AEROSPACE  
1270 ABERDEEN STREET  
HAWKESBURY, ON K6A 1K7

Customer ID		Customer PO		Payment Terms	
DARA		PO17555		Net 30 Days	
Shop Order No.		Shipping Method		Ship Date	Due Date
73276		R & L CARRIER		8/16/12	9/15/12
Quantity	Item	Description		Unit Price	Extensi
1	EACH	OR AMS 2759-IC) SANDBLAST AFTER HT D350-748-241TRN HEAT TREAT TO MIN 180 KSI (MIL-T-6736 OR AMS 2759-IC)		205.000	20
1	EACH	SANDBLAST AFTER HT D350-748-241TRN HEAT TREAT TO MIN 180 KSI (MIL-T-6736 OR AMS 2759-IC)		205.000	20
1	EACH	SANDBLAST AFTER HT D350-748-241TRN HEAT TREAT TO MIN 180 KSI (MIL-T-6736 OR AMS 2759-IC)		205.000	20
1	EACH	SANDBLAST AFTER HT D350-748-241TRN HEAT TREAT TO MIN 180 KSI (MIL-T-6736 OR AMS 2759-IC)		205.000	20
		250 POUNDS TOTAL			

ANY DISCREPANCIES MUST BE REPORTED WITHIN 10 DAYS AFTER RECEIPT.

**We accept AMEX, Visa & Master Card**




Heat Treating and Metallurgical Consulting

Subtotal	2,05
Shipping/Handling	
Total Invoice Amount	2,05
Payment Received	
<b>TOTAL</b>	<b>2,05</b>

Visit our Web Site: <[www.thomasregister.com/metlab/](http://www.thomasregister.com/metlab/)>

# North American Free Trade Agreement Certificate of Origin

Please print or type

1. Exporter's Name and Address:  <b>Metlab</b> <b>1000 E. Mermaid Lane</b> <b>Wyndmoor, PA 19038</b>  Tax Identification Number: <b>23-2973306</b>		2. Blanket Period: (dd/mm/yyyy)  From: <b>01/01/2012</b> To: <b>31/12/2012</b>			
3. Producer's Name and Address:  <b>Metlab</b> <b>1000 E. Mermaid Lane</b> <b>Wyndmoor, PA 19038</b>  Tax Identification Number: <b>23-2973306</b>		4. Importer's Name and Address:  <b>Dart Aerospace</b> <b>1270 Aberdeen Street</b> <b>Hawkesbury, ON K6A 1K7</b> <b>CANADA</b>  Tax Identification Number:			
5.  Description of Good(s)	6.  HS Tariff Classification Number	7.  Preference Criterion	8.  Producer	9.  Net Cost	10.  Country of Origin
<b>Heat Treatment Services</b>	<b>8483.401</b>	<b>C</b>	<b>Yes</b>	<b>No</b>	<b>USA</b>
11. I CERTIFY THAT:  <ul style="list-style-type: none"> <li>* the Information on this document is true and accurate and I assume the responsibility for proving such representations. I understand that I am liable for any false statements or material omissions made on or in connection with this document;</li> <li>* I agree to maintain, and present upon request, documentation necessary to support this Certificate, and to inform, in writing, all persons to whom the Certificate was given of any changes that would affect the accuracy or validity of this Certificate;</li> <li>* the goods originated in the territory of one or more of the Parties, and comply with the origin requirements specified for those goods in the North American Free Trade Agreement, and unless specifically exempted in Article 411 or Annex 401, there has been no further production or any other operation outside the territories of the Parties; and</li> <li>* this Certificate consists of <u>One (1)</u> page, including all attachments.</li> </ul>					
Authorized Signature: 			Company: <b>Metlab</b>		
Name: <b>Mark Podob</b>			Title: <b>Vice President</b>		
Date: (mm/dd/yyyy) <b>8/16/2012</b>		Telephone: <b>215-233-2600</b>		Fax: <b>215-233-5653</b>	



Commercial Invoice:145

**Ship From:** Dart Aerospace Ltd.  
1270 Aberdeen Street  
Hawkesbury, ON K6A 1K7  
Canada  
Tel # 1.613.632.5200  
GST # RT101272607

**Ship To: METLAB**  
1000 E Mermaid LN  
Wyndmoor  
PA, 19038 US

**ATTN: Mark Podob**  
**PH#** 215 233 2600

**Date:** 27-Jul-12 **P.O. # 17555**

**Ship Via:** Day & Ross PPD **FOB:Origin**

Item	Part Number / Product Description	Tariff Class.	Quantity	Unit Price	Total
1	Crosstube D350-748-241	8803.20	10	\$ 1,250.00	\$ 12,500.00
2					
3					
4					

**All Prices are in US Dollars**

**All of the above parts were made in Canada unless otherwise indicated**  
**THIS IS A CUSTOMS INVOICE ONLY**

Sub Total \$12,500.00

Total \$12,500.00

**Amount Due: \$12,500.00**

Dart Aerospace Ltd.  
1270 Aberdeen Street  
Hawkesbury, ON K6A 1K7  
Canada  
Tel.: 1.613.632.5200  
Fax: 1.613.632.1185  
GST # RT101272607



1000 E. Mermelid Ln., Wyndmoor (Phila.) PA 19038-8093  
Tel. (215) 233-2600 Fax (215) 233-6653

**ORDER ACKNOWLEDGEMENT**

E-MAILED TO: \_\_\_\_\_

FAXED TO: \_\_\_\_\_

613 632 1053

QF-4.7.2.2-01

Rev A. 5/10/10

CUSTOMER: <i>Dart</i>	PO NUMBER: <i>P017555</i>
DATE MATERIAL RECEIVED: <i>8/1/2012</i>	METLAB QUOTE NUMBER: <i>N/A</i> Or, MINIMUM STD ORDER(CHECK) _____
ESTIMATED SHIP DATE: <i>8/15/12</i>	METLAB S.O. NUMBER: <i>173277</i>

THANK YOU FOR YOUR ORDER. WE WILL MAKE OUR BEST EFFORT TO SHIP YOUR ORDER ON OR BEFORE THE ESTIMATED SHIP DATE SHOWN ABOVE. IF YOU NEED TO CONTACT US REGARDING THIS ORDER, PLEASE REFERENCE THE METLAB S.O. NUMBER SHOWN ABOVE.

QUOTATION MISSING? ☒ OK TO PROCESS WITHOUT *DM*

PURCHASE ORDER MISSING? \_\_\_\_\_ OK TO START PROCESSING WITHOUT \_\_\_\_\_

NOTE THAT WE NEED THE FOLLOWING INFORMATION IN ORDER TO COMPLETE YOUR ORDER AND TO MEET THE PROMISED SHIP DATE:

TECHNICAL INFORMATION REQUIRED(LIST) : \_\_\_\_\_ ON HOLD : YES \_\_\_\_\_ NO \_\_\_\_\_

OTHER INFORMATION OR CLARIFICATION: \_\_\_\_\_ ON HOLD : YES \_\_\_\_\_ NO \_\_\_\_\_

RELEASED FOR PROCESSING BY: *Duc* DATE: *8/8/12*

ACKNOWLEDGED BY: \_\_\_\_\_

TODAY'S DATE: \_\_\_\_\_

SHIPPED DATE: \_\_\_\_\_

THIS ORDER IS ACKNOWLEDGED WITH THE UNDERSTANDING THAT THE ABOVE PURCHASE ORDER IS IN ACCORDANCE WITH METLAB'S TERMS AND CONDITIONS OF SALE AS SUBMITTED AT THE TIME OF THE ABOVE QUOTATION.



# STRAIGHT BILL OF LADING - 1.866.DAY.ROSS

OTT 1983132 0



NIR R-500048-5

BILLER INIT. INITIALES PROPRIETAIRES À LA FACTURATION	OFF UNIT DÉCHARGE DU VÉHICULE NO.	NO. OF PIECES QUANTITÉ DE MORCEAUX
	ON UNIT CHARGE DANS VÉHICULE NO.	NO. OF PIECES QUANTITÉ DE MORCEAUX

DATE MONTH DAY YEAR 07 27 12	LEVEL OF SERVICE <input type="checkbox"/> GENERAL	C.O.D. AMOUNT CURRENCY: <input type="checkbox"/> CDN <input type="checkbox"/> U.S.	Pick Up Information Telephone Number: Contact Name: Ready Date & Time: Closing Time:
<input type="checkbox"/> PRIVATE RESIDENCE PICK UP <input type="checkbox"/> PRIVATE RESIDENCE DELIVERY <input type="checkbox"/> PALLETS BEING RETURNED <input type="checkbox"/> HAZARDOUS GOODS* <input type="checkbox"/> APPOINTMENT DELIVERY (DATE/TIME)	<input type="checkbox"/> TAILGATE PICK UP <input type="checkbox"/> HEATED SERVICE <input type="checkbox"/> TRADE SHOW PU <input type="checkbox"/> INBOND	<input type="checkbox"/> TAILGATE DELIVERY <input type="checkbox"/> TEMPERATURE CONTROL (TL ONLY) <input type="checkbox"/> TRADE SHOW DELIVERY	
*this shipment contains dangerous goods as set out in the attached shipper's declaration		REQUESTED BY: <input type="checkbox"/> SHIPPER <input type="checkbox"/> CONSIGNEE <input type="checkbox"/> BILL TO <input type="checkbox"/> THIR	EMAIL:

SHIPPER DAY & ROSS ACCT. NO. 038326 TEL NO. 6136325200 SHIPPER'S NAME	CONSIGNEE DAY & ROSS ACCT. NO. TEL NO. 215 233 CONSIGNEE'S NAME Mark Podob
PICK UP ADDRESS DART Aerospace 1270 Aberdeen St HAWKESBURY ON K1A1K7 CITY PROV. COUNTRY POSTAL CODE	DELIVERY ADDRESS MetLab 1000 E. Mermaid Ln WYNDMOOR PA 1 CITY PROV. COUNTRY POSTAL CODE

METHOD OF PAYMENT <input checked="" type="checkbox"/> PREPAID <input type="checkbox"/> COLLECT <input type="checkbox"/> CASH IN ADVANCE AMOUNT CURRENCY: <input type="checkbox"/> CDN <input type="checkbox"/> THIRD PARTY BILL TO ACCOUNT NUMBER <input type="checkbox"/> VISA <input type="checkbox"/> M.C. <input type="checkbox"/> AMX EXPIRY DATE CARD NO.	OTHER BILL TO PARTICULARS BILL TO: BILL TO ADDRESS GST: CITY PROV. COUNTRY POSTAL CODE
--	--

SPOT QUOTE NO.	ROUTING OR SPECIAL INSTRUCTIONS	MAXIMUM LIABILITY OF \$2.00/LB OR \$4.41/KG COMPUTED ON THE TOTAL ACTUAL WEIGHT UNLESS DECLARED VALUATION STATES OTHERWISE. PLEASE SEE ADDITIONAL TERMS AND CONDITIONS ON REVERSE.
NO. OF PCS.	DESCRIPTION OF ARTICLES AND SPECIAL MARKS	WEIGHT <input checked="" type="checkbox"/> LBS <input type="checkbox"/> KGS
5	cardboard cartons	DECLARED VALUE <input type="checkbox"/> CDN <input type="checkbox"/> U.S.
		2.50
		126x13x17
ALL USED HOUSEHOLD GOODS AND PERSONAL EFFECTS SHIPPED AT SHIPPER'S RISK OF DAMAGE		

The uniform TERMS OF CARRIAGE apply to this BILL OF LADING. (See Term and Condition No. 1)

NOTICE OF CLAIM must be submitted in writing within sixty (60) days of delivery. (See Term and Condition No. 2)

The carrier's maximum liability is limited by the TERM CONDITIONS of the Bill of Lading. (See Term and Condition No. 5)

SHIPPER'S REF. NO.	PO 17555
SHIPPER'S SIGNATURE	Brigitte Alder
PRINT	BRIGITTE Golder

PICK-UP DATE	07-27-2012	NO. OF PCS.	
DAY & ROSS DRIVER	Denis	PURCHASE ORDER	
POWER NO.	270604	TRAILER NO.	16

0111 JEN 1275



Dart Aerospace Ltd.  
1270 Aberdeen Street  
Hawkesbury, ON K6A 1K7  
Tel: 613 632 9577  
Fax: 613 632 1053

## PURCHASE ORDER

Purchase Order ID **PO17555**

Purchase Order Date 7/27/2012

PO Print Date 7/27/2012

Page Number 3 of 3

**Order From :**

VU-MET001

METLAB  
1000 E. MERMAID LANE  
WYNDMOOR, PA 19038  
USA

Contact Name		Buyer	Brigitte Golden
Vendor Phone	215-233-2600	Requisition Nbr	
Vendor Fax	215-233-5653	Tax Resale Nbr	10127-2607
Vendor Account Nbr		Terms	Net 30
		Currency	USD
		FOB	Destination-Collect

Special Inst: SAME AS ABOVE

PO Total: \$2,050.00

PO Instructions: CROSSTUBE WILL BE LEAVING THIS AFTERNOON WITH DAY&ROSS TRACKING # OTT19831320

No substitution or deviation without consent.

Certificate of Conformity or Material Certification required - YES NO

Change Nbr: 1

Change Date: 7/27/2012



Dart Aerospace Ltd.  
1270 Aberdeen Street  
Hawkesbury, ON K6A 1K7  
Tel: 613 632 9577  
Fax: 613 632 1053

## PURCHASE ORDER

Purchase Order ID PO17555

Purchase Order Date 7/27/2012

PO Print Date 7/27/2012

Page Number 2 of 3

Order From :

VU-MET001

METLAB  
1000 E. MERMAID LANE  
WYNDMOOR, PA 19038  
USA

Contact Name		Buyer	Brigitte Golden
Vendor Phone	215-233-2600	Requisition Nbr	
Vendor Fax	215-233-5653	Tax Resale Nbr	10127-2607
Vendor Account Nbr		Terms	Net 30
		Currency	USD
		FOB	Destination-Collect

		Special Inst:	SAME AS ABOVE					
5	84659	D350-748-141TRN	10:40:00 AM	✓	1.00	Day & Ross ppd	\$205.0000	\$205.0
			Yes					
		Special Inst:	SAME AS ABOVE					
6	86271	D350-748-141TRN	10:40:00 AM	✓	1.00	Day & Ross ppd	\$205.0000	\$205.0
			Yes					
		Special Inst:	SAME AS ABOVE					
7	84666	D350-748-241TRN	10:40:00 AM	✓	1.00	Day & Ross ppd	\$205.0000	\$205.0
			Yes					
		Special Inst:	SAME AS ABOVE					
8	84660	D350-748-141TRN	10:40:00 AM	✓	1.00	Day & Ross ppd	\$205.0000	\$205.0
			Yes					
		Special Inst:	SAME AS ABOVE					
9	84675	D350-748-241TRN	10:40:00 AM	✓	1.00	Day & Ross ppd	\$205.0000	\$205.0
			Yes					
		Special Inst:	SAME AS ABOVE					
10	86266	D350-748-141TRN	10:40:00 AM	✓	1.00	Day & Ross ppd	\$205.0000	\$205.0
			Yes					

PO Instructions: CROSSTUBE WILL BE LEAVING THIS AFTERNOON WITH DAY&ROSS TRACKING # OTT19831320 No substitution or deviation without consent.  
Certificate of Conformity or Material Certification required - YES NO

Change Nbr: 1

Change Date: 7/27/2012





Dart Aerospace Ltd.  
1270 Aberdeen Street  
Hawkesbury, ON K6A 1K7  
Tel: 613 632 9577  
Fax: 613 632 1053

## PURCHASE ORDER

Purchase Order ID **PO17555**

Purchase Order Date 7/27/2012

PO Print Date 7/27/2012

Page Number 1 of 3

**Order From :**

VU-MET001

METLAB  
1000 E. MERMAID LANE  
WYNDMOOR, PA 19038  
USA

**Contact Name**

**Vendor Phone** 215-233-2600

**Vendor Fax** 215-233-5653

**Vendor Account Nbr**

**Buyer**

Brigitte Golden

**Requisition Nbr**

**Tax Resale Nbr**

10127-2607

**Terms**

Net 30

**Currency**

USD

**FOB**

Destination-Collect

**Ship To :**

DART AEROSPACE LTD  
1270 ABERDEEN  
HAWKESBURY, ON K6A 1K7  
CANADA

Line Nbr	Reference Revision ID Vendor Part Number	Description/ Mfg ID	Req Date/ Taxable	Req Qty/ Unit of Measure	Ship Method	Unit Price	Extended Price
1	84674	D350-748-241TRN	10:40:00 AM Yes	✓ 1.00	Day & Ross ppd	\$205.0000	\$205.00
		<b>Special Inst:</b> HEAT TREAT TO MIN 180 KSI (MIL-T-6736 OR AMS 2759-1C) SAND BALST TUBE AFTER HEAT TREAT CERTIFICATIONS					
2	84667	D350-748-241TRN	10:40:00 AM Yes	✓ 1.00	Day & Ross ppd	\$205.0000	\$205.00
		<b>Special Inst:</b> SAME AS ABOVE					
3	84670	D350-748-241TRN	10:40:00 AM Yes	✓ 1.00	Day & Ross ppd	\$205.0000	\$205.00
		<b>Special Inst:</b> SAME AS ABOVE					
4	84676	D350-748-241TRN	10:40:00 AM Yes	✓ 1.00	Day & Ross ppd	\$205.0000	\$205.00

**PO Instructions:** CROSSTUBE WILL BE LEAVING THIS AFTERNOON WITH DAY&ROSS TRACKING # OTT19831320

No substitution or deviation without  
consent.  
Certificate of Conformity or Material  
Certification required - YES NO

**Change Nbr:** 1

**Change Date:** 7/27/2012





## Brigitte Golden

---

**From:** Mark Podob <mpodob@metlabheattreat.com>  
**Sent:** Friday, July 27, 2012 11:21 AM  
**To:** Dan Krackovic; Doris Funches; Eugene Roberts  
**Cc:** Brigitte Golden  
**Subject:** FW: PO17555 from Dart  
**Attachments:** PO17555 METLAB.pdf

New P.O. from Dart Aerospace attached.  
Thanks.

Mark Podob  
Vice President, Marketing and Sales  
Metlab  
1000 E. Mermaid Lane  
Wyndmoor, PA 19038  
215-233-2600 Ext. 232  
(F) 215-233-5653  
[mpodob@metlabheattreat.com](mailto:mpodob@metlabheattreat.com)

This message and any attachments are intended for the individual or entity named above. If you are not the intended recipient, please do not forward, copy, print, use or disclose this communication to others; also please notify the sender replying to this message and then delete it from your system.

---

**From:** Brigitte Golden [<mailto:bgolden@dartaero.com>]  
**Sent:** Friday, July 27, 2012 11:19 AM  
**To:** Mark Podob  
**Cc:** 'Linda Lacelle'  
**Subject:** PO17555 from Dart

Please find attached the PO  
Thank You

---

**From:** Linda Lacelle [<mailto:llacelle@dartaero.com>]  
**Sent:** Thursday, July 26, 2012 2:36 PM  
**To:** [mpodob@metlabheattreat.com](mailto:mpodob@metlabheattreat.com)  
**Cc:** Brigitte Golden  
**Subject:** more tubes

Hi Mark,  
We will be shipping out 9 tubes tomorrow for heat treat. Another batch should follow end of next week. As always, I need these asap..  
Thx!

Linda Lacelle  
Production manager  
Dart Aerospace